RECEIVING APPARATUS, INFORMATION PROCESSING APPARATUS
AND METHODS THEREOF

BACKGROUND OF THE INVENTION

5   Field of the Invention

The present invention relates to a receiving
apparatus, an information processing apparatus and
methods thereof, and more particularly to using and
management of a user profile.

10 Related Background Art

Currently, various media deliver information to
each home. For example, television, radio or data
broadcasting are delivered using ground wave,
satellite or CATV (cable television) as a

15 broadcasting wave, and video, audio and information
service also are delivered through the Internet or
e-mail.

Additionally, digital broadcasting systems are
recently spread to deliver a television signal as a

20 digital signal in the broadcasting satellite
(hereinafter, referred to as "BS") broadcasting,
communication satellite (hereinafter, referred to as
"CS") broadcasting or CATV. Such systems may employ
several hundreds of channels by adopting a

25 compressing/coding technique or digital delivering
technique. Therefore, it becomes possible to receive
the increased number of image, voice programs and

data broadcasting programs rather than the past.

In such a circumstance, among those many programs, there has been recently proposed a technique so that a user may efficiently search and
5 list a desired or purposed program.

For an example, a function of searching a program in a genre the user desires or meeting a keyword by using an electronic program guide (hereinafter, referred to as "EPG") multiplexed in
10 the digital broadcasting is already designed.

Also, a technique of accumulating a viewing history of a user and then automatically searching and presenting a program according to a preference level of the user obtained based on the viewing
15 history is also under development.

By accumulating various viewing and handling histories of a user, and then preparing information peculiar to the user, or a user profile, with the history information to select, propose and accumulate
20 programs or information based on the user profile as described above, the user may access desired information more comfortably.

Such a user profile is prepared based on a history that the user has used an apparatus.
25 Therefore, when the apparatus is used for the first time, it is impossible to search or select information based on the user profile because there

is no user profile.

SUMMARY OF THE INVENTION

Under such circumstances, the present invention
is designed to solve such problems of the prior art,
and an object of the invention is to realize
searching and selecting information more comfortably
even if a desired user profile does not exist in an
apparatus.

In order to accomplish the above object,
according to an aspect of the present invention,
there is provided a receiving apparatus for receiving
television broadcasting signals, comprising a
manipulating unit for instructing operation of the
receiving apparatus, profile processing means for
updating contents of an internal user profile based
on a manipulating history of the manipulating unit,
external interface means for inputting an external
user profile from outside of the receiving apparatus,
selection means for selectively outputting the
internal user profile processed by the profile
processing means and the external user profile input
from the external interface means, and searching
means for searching a program among the television
broadcasting signals based on the internal user
profile or the external user profile, output from the
selection means.

These and other features and aspects of the present invention will become better understood with regard to the following description for embodiments of the present invention with reference to the following accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing a receiving apparatus to which the present invention is applied.

Fig. 2, which is comprised of Figs. 2A and 2B, is a flowchart for illustrating an operation of the apparatus of Fig. 1.

Fig. 3 shows a display picture screen by the apparatus of Fig. 1.

Fig. 4, which is comprised of Figs. 4A and 4B, is a flowchart for illustrating another operation of the apparatus of Fig. 1.

Fig. 5 shows another receiving apparatus to which the present invention is applied.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings.

Fig. 1 is a block diagram showing a receiving apparatus to which the present invention is applied.

The receiving apparatus 100 of Fig. 1 receives

a broadcasting wave with an antenna 101 and displays image, voice or information (e.g. data broadcasting) related to a channel selected by a user on a display apparatus 141 according to the command from a remote
5   commander 139.

In Fig. 1, an information receiving unit 103 selectively receives an electric wave of frequency conforming to the channel selected by the remote commander 139 from the digital broadcasting signal
10 delivered through the antenna 101, and then executes demodulation, A/D conversion, error correction, and scramble decoding when required, and then generates a data train, which is called transport stream regulated as MPEG2.

15 An information separating unit 105 separates the transport stream output from the information receiving unit 103 into image data, voice data, data broadcasting data and data attendant on those data, and then outputs the image data, the voice data and
20 the data broadcasting data to a decoder 111 and outputs the attendant data to a program information extraction unit 107.

The program information extraction unit 107 extracts program information, which is multiplexed to
25 television broadcasting signals and is delivered as program-related information, to store in a program information storing unit 109. This program

information, for example, includes title,
broadcasting date, time (broadcast start and end
times), category, sub category, story and performers,
which are personally provided from a broadcasting
5   station.

On the other hand, the decoder 111 decodes the
image data, the voice data and the data broadcasting-
related data respectively, and then outputs data for
displaying the image data and the data broadcasting-
10   related data to the display controlling unit 113.
And, the voice data is supplied to a voice monitor or
an external television monitor, not shown.

And, a user profile storing unit 129 stores an
internal user profile generated by a user profile
15   processing unit 127. In this embodiment, the
internal user profile is a personal profile for each
user who commonly uses the receiving apparatus 100,
and is, for example, independently managed for each
member of a family. But for some case, it is also
20   possible to manage profiles of members of a family as
one family profile.

The internal user profile managed in this
embodiment is data including information of
preference, life pattern, etc. of the user. And, the
25   user profile processing unit 127 generates the
internal user profile based on preset basic user
information such as age, sex, residence region,

desired genre, etc. of the user as well as a viewing
history of how long and which broadcasting media the
user has watched at a certain time, and then stores
the generated internal user profile in the user
5   profile storing unit 129.

A user profile selection unit 133 selects one
of an external user profile 137 input from an
external I/F 131 and the internal user profiles
stored in the user profile storing unit 129 and then
10 writes the selected one in a user profile buffer 135.

A comparison searching unit 115 comparatively
processes program information stored in the program
information storing unit 109 and the internal or
external user profile stored in the user profile
15 buffer 135 according to a predetermined algorithm so
as to search a program conforming to a user
preference among programs which are currently or
willing to be broadcasted.

A guidance picture screen generating unit 117
20 generates a picture screen for proposing a program or
information, recommended based on the comparison of
the comparison searching unit 115, in addition to a
common EPG picture screen according to a command of
the remote commander 139. At this time, the
25 recommending picture screen may be displayed as a
part of the common EPG picture screen. And, it is
also preferred to compose the guidance picture screen

only with the recommending program.

Data of the generated guidance picture screen is output to the display controlling unit 113.

The display controlling unit 113 is controlled
5   by a control unit 125 commanded by the remote commander 139, and switches or multiplexes a picture screen based on the image data from the decoder 111 and the guidance picture screen from the guidance picture screen generating unit 117 to be displayed in
10   the display apparatus 141.

And, the user may select a desired program or channel by manipulating the guidance picture screen or EPG picture screen displayed on the display apparatus 141 with the remote commander 139. In this
15   embodiment, the remote commander 139 has a power key, a menu key, up/down/right/left cursor keys, an EPG key for instructing display or erasure of the EPG picture screen, a search key for instructing program search, and so on, and the user may instruct
20   operation of the receiving apparatus 100 by manipulating these keys.

A command receiving unit 123 receives a command from the remote commander 139 and outputs the command to the control unit 125 and a viewing history storing
25   unit 119.

The control unit 125 controls functions of each unit according to the command from the remote

commander 139 output through the command receiving
unit 123.

A calendar clock 121 provides date, a day of
the week and time to the viewing history storing unit
119 in connection with the command receiving unit 123.
This calendar clock 121 stores information of a
program as a viewing history only when it is
determined that the user views the program over a
predetermined period, based on the output of the
calendar clock 121 and the received command from the
command receiving unit 123.

The viewing history storing unit 119 stores a
table indicating history of program or information
that the user has viewed, based on manipulated
results of the remote commander 139 from the command
receiving unit 123 and program information stored in
the program information storing unit 109. Contents
in the table include not only basic information such
as broadcasting date, day of the week, time, title,
category, sub-category etc. but also detailed
information particularly provided from the
broadcasting station such as producer, produced date,
director, players etc.

The user profile processing unit 127 processes
data input from the viewing history storing unit 119
and previously-input basic user information such as
age, sex, residence, preferred genre etc. of the user,

according to a predetermined algorithm so as to
generate the internal user profile including
information such as user taste or life pattern, and
then stores the user profile in the generated user
5   profile storing unit 129.

And, the external user profile 137 is a user
profile supplied from outside of the receiving
apparatus 100. In this embodiment, a user profile
managed by a user connected through an external
10   network such as Internet, a user profile stored in a
portable recording medium such as IC card or a user
profile stored in, for example, a portable terminal
may be used.

The external I/F 131 is an interface to receive
15   the external user profile 137 into the receiving
apparatus 100 and may be varied depending on the sort
of the external user profile 137. For example, a
modem or LAN is used in case that the user profile is
laid on the external server, while, if the external
20   user profile is recorded on a portable recording
medium such as IC card, a PCMCIA interface or a
specific interface for each card is used. In
addition, if the external user profile is managed by
a mobile phone or PDA, a USB, Bluetooth or infrared
25   interface may be used.

The receiving unit 100 of this embodiment is
configured as above, and characterized in that it

enables program search using the external user
profile in addition to the internal user profile
stored in the user profile storing unit 129.

Therefore, the user may search a program
5   conforming to his/her taste by providing the
receiving apparatus 100 with his/her own user profile
as the external user profile, even when the user
handles the receiving apparatus 100 for the first
time.

10   Hereinafter, operations for the external user
profile in this embodiment are described in detail
with reference to a flowchart of Figs. 2A and 2B.

Figs. 2A and 2B are flowcharts for illustrating
operation of the receiving apparatus of Fig. 1 on the
15   basis of control of the control unit 125 related to
program searching and selecting operations.

First, when a common television receiving
process is executed (step S201), the user manipulates
keys to instruct a user identifying picture screen
20   with the remote commander 139 (step S202), and then
the guidance picture screen generating unit 117
generates a picture screen for user identification to
be displayed on the display apparatus 141 by the
display control unit 113 (step S203). The
25   identifying picture screen displayed as above may has,
for example, a format of displaying a user name,
previously registered in a lower portion of the

picture screen or a format of displaying an icon corresponding to each user as shown in Fig. 3.

And, the present embodiment displays a user name "guest" among a user option in addition to the
5   user names registered in the receiving apparatus 100 in advance.

The user informs his/her identity to the control unit 125 by manipulating the cursor keys or enter key or a key corresponding to each icon or
10   option on the remote commander with seeing the user registration picture screen (step S203).

If a registered user name is selected, the guidance picture screen generating unit 117 additionally generates a profile selecting picture
15   screen to be displayed on the display apparatus 141 by the display control unit 113. In this picture screen, the user may select which the internal user profile (because of the registered user, the internal user profile based on the viewing history of the
20   receiving apparatus 100 is stored in the user profile storing unit 129 of course) or the external user profile is to be used (step S204).

If the internal user profile is selected, the control unit 125 controls the user profile selection
25   unit 133 so as to select the user profile selected in the step S203 among the registered user profiles stored in the user profile storing unit 129 and then

store the user profile in the user profile buffer 135
(step S205). And, the profile selecting picture
screen is erased to display a common television
program to stand by ready for receiving a program
5   searching instruction from the remote commander 139
(step S206).

    And, if the program search key is selected on
the remote commander 139, the comparison searching
unit 115 searches programs using the internal user
10   profile (step S207), and then on the basis of the
results, the guidance picture screen generating unit
117 generates a guidance picture screen including a
recommended program selected based on the search
results to be displayed on the display apparatus 141
15   by the display control unit 113 (step S208).

    The user confirms this program guidance picture
screen and then selects a desired program by
manipulating each key on the remote commander 139
(step S209). And, if a predetermined time is passed
20   without manipulating the program after displaying the
guidance picture screen (step S210), the guidance
picture screen is erased to display a common
television picture screen (step S211).

    And, if a desired program is selected on the
25   program guidance picture screen in the step S209, the
program guidance picture screen is erased to switch
to a channel received by the information receiving

unit 103 (step S212). And, if a program is viewed
for a certain period as described above, the viewing
history storing unit 119 stores the viewing result as
a viewing history on the basis of output of the

5   calendar clock 121 (step S213), and the user profile
processing unit 127 additionally updates the internal
user profile on the basis of the updated viewing
history (step S214). And, the user profile
processing unit may update the internal user profile

10   just after the viewing history is updated or at
midnight or time when the user commonly does not view
the television.

      And, if there is no instruction by the program
search key in the step S206, it is detected that

15   there is a direct channel changing instruction from
the remote commander 139, and if there is a channel
changing instruction, the process is forwarded to the
step S212 (step S215). The procedure after the step
S212 is identical to the above-described processes.

20   In addition, though there is no channel changing
instruction, the process is forwarded to the step
S206 to repeat the above-described procedure.

      On the other hand, if the guest user is
selected in the step S203 or if the external user

25   profile is selected in the step S204, the control
unit 125 controls the user profile selection unit 133
to select the external user profile 137 provided

through the external I/F and store in the user
profile buffer 135 (Step S216). At this time, the
external I/F 131 should be accessible to the external
user profile. For example, in case that the external
5   user profile 137 is carried on an IC card, the IC
card should be inserted into a PCMCIA slot acting as
the external I/F 131.

    And, if there is a program searching
instruction from the remote commander 139 (step S217),
10   the comparison searching unit 115 searches programs
based on he external user profile stored in the user
profile buffer 135 (step S218), and with the results,
the guidance picture screen generating unit 117
generates a program guidance picture screen including
15   recommended programs selected by the search results
to be displayed on the display apparatus 141 by the
display control unit 113 (step S219).

    The user confirms this program guidance picture
screen and then selects a desired program by
20   manipulating the cursor keys or the enter key on the
remote commander 139 (step S220). And, if a
predetermined time is passed without manipulating the
program after displaying the guidance picture screen
(step S221), the process is forwarded to the step
25   S222 to erase the program guidance picture screen and
the process is forwarded to the step S224.

    And, if a desired program is selected on the

program guidance picture screen in the step S220, the
program guidance picture screen is erased to switch
to a channel received by the information receiving
unit 103 (step S223).

5   And, if a predetermined time has elapsed after
storing the external user profile in the user profile
buffer 135 (step S224), the external user profile
stored in the user profile buffer 135 is deleted
(step S225).

10   In the end, after deleting the external user
profile in the step S225, it is impossible in this
embodiment to search programs using the external user
profile without selecting the external user again in
the user identifying picture screen to store the
15   external user profile in the user profile buffer 135.

As described above, because the present
embodiment enables to search programs based on the
external user profile existing outside of the
apparatus as well as the internal user profile, it
20   makes it possible to search a program suitable for a
taste or life pattern of the user though the user
profile is not stored in the receiving apparatus as
an internal user profile.

In addition, because the external user profile
25   is deleted in a predetermined time after being stored
in the user profile buffer, a profile of a guest user
is not left in the receiving apparatus.

In that reason, it may prevent a problem that a registered user abnormally uses an external user profile of a guest, who is not a member of a family using the receiving apparatus 100 as usual, to search
5   undesired programs.

In addition, though it is described that the external user profile is deleted in a predetermined time after being stored in the user profile storing unit 133 in the processes of Figs. 2A and 2B, it is
10   not limited to that case but, for example, it may be deleted as soon as the program searching process is completed. In this case, the external user profile is stored in the user profile storing unit 133 whenever receiving a program searching instruction
15   from a guest user.

Furthermore, though a history of a guest user of manipulating the receiving apparatus 100 is not included in the external user profile in the processes of Figs. 2A and 2B, it is also preferable
20   that a guest user may select whether or not to reflect on the external user profile a result of manipulating the receiving apparatus 100 by the guest user.

Figs. 4A and 4B are flowcharts for illustrating
25   the process of reflecting the history of the guest member of manipulating the receiving apparatus 100 as described above. And, in Figs. 4A and 4B, same

process has same reference numeral as Figs. 2A and 2B, and not described in detail.

Difference from the processes of Figs. 2A and 2B is the procedure shown in steps S226 to S228. That is, in Figs. 4A and 4B, after the channel changing process of the step S223, the guidance picture screen generating unit 117 generates a selection picture screen for the profile updating process to be displayed on the display apparatus 141. And, the user selects whether or not to reflect a channel changing result of this time on the external user profile to be updated (step S226).

And, if the updating of the user profile is selected, the user profile processing unit 127 reads out the external user profile stored in the user profile buffer 135 and updates its content by reflecting the channel changing manipulation based on the viewing history information stored in the viewing history storing unit 119 and then records the updated external user profile in the user profile buffer 135 and at the same time outputs the external user profile outside through the external I/F 131.

And, the step S228 of Fig. 4B monitors not only the channel changing caused by the program searching but also whether the user changes the channel by direct key manipulation, and even if the user changes the channel by directly manipulating the keys, the

channel changing result of this time may be reflected on the external user profile.

In addition, though it is described that the guest user selects whether or not the external user
5 profile is updated at every time of performing the channel changing in Figs. 4A and 4B, it is not limited to this case, but it is also preferable that the user may select whether or not the external user profile is updated at the point of determining to use
10 the external user profile in the step S203 or S204.

As described above, in the procedure of Figs. 4A and 4B also, the program searching process may be performed based on the external user profile. In addition, when the user desires, the external user
15 profile can be updated based on the viewing history of the receiving apparatus 100.

And, because the external user profile is deleted in a predetermined time after being stored in the user profile buffer in the procedure of Figs. 4A
20 and 4B also, there is not caused the case that the programs are searched based on the external user profile of a guest user by mistake.

Now, a second embodiment of the present invention is described.
25 Fig. 5 is a block diagram showing another example of the receiving apparatus 100 to which the present invention is applied. This receiving

apparatus 100 of Fig. 5 may receive a broadcasting
signal from CATV 143 and image or data information
from a network 145 in addition to the television
broadcasting from the antenna 101, compared with the
5   receiving apparatus of Fig. 1. In addition, a
storage unit 147 is installed to store received
signals.

        And, as shown in Figs. 2A, 2B, 4A and 4B, the
above embodiment performs the program searching and
10   displays the program guidance picture screen, when
receiving a program search instruction from the user.

        In the present invention, the program searching
is periodically performed at a predetermined interval
by the comparison searching unit 115 regardless of
15   the fact that the user is viewing the television
broadcasting or not, even when there is no program
searching instruction from the user. In addition, in
the case that, for example, the power is not supplied
to the receiving apparatus 100 at an initiating time
20   of a program which the user habitually watches, it is
possible that the storage unit 147 automatically
stores a program designated according to a search
result from the comparison searching unit 115.

        In addition, even when the comparison searching
25   unit 115 is searching programs, the image data and
the voice data stored in the storage unit 147 may be
inclusively searched in addition to programs of the

television broadcasting received by the information receiving unit 103.

That is, when there is a program searching instruction from the user, the comparison searching
5   unit 115 reads out program information of the image and voice data stored in the storage unit 147 in addition to the program information stored in the program information storing unit 109, performs the program searching according to such program
10   information, and then outputs the result to the guidance picture screen generating unit 117.

At this time, the guidance picture screen is displayed so that the recommended programs among the television broadcasting signals received by the
15   information receiving unit 103 and the image and voice data stored in the storage unit 147 are recognizable.

The storage unit 147 may use HDD or magneto-optical apparatus, and stores data output from the
20   information separating unit 105. And, the data stored in the storage unit 147 is decoded in the decoder 111 and output to the display control unit 113.

By installing the storage unit 147 as described
25   above, the range of selection or instruction of programs or information becomes broader as well as it is also possible to control automatic backing up on

the basis of the user profile, so extending the range
of utilizing the user profile.

In addition, the apparatus of Fig. 5 may
receive various information from the CATV circuit 143
5   or the network 145 such as telephone lines.

In this point, the information received from
the network 145 by the information receiving unit 103
is output to the display control unit 113 from the
information separating unit 105 without interposing a
10 decoder. The display control unit 113 has functions
of interpreting information described in various
descriptive languages such as HTML data among
information supplied from the network 145 and
develops the attached image data to an inner memory.
15 And, in this embodiment, information of an
Internet homepage viewed by a network browser
possessed in the display control unit 113, such as a
URL or a title, are extracted by the information
separating unit 105 and stored through the program
20 information storing unit 109 in the viewing history
storing unit 119, and then used to process the user
profile by the user profile processing unit 127.

That is, when receiving an instruction of
viewing Internet from the remote commander 139, the
25 control unit 125 informs it to the user profile
processing unit 127. The user profile processing
unit 127 at this time inputs information of the

instructed homepage to the viewing history storing
unit 119 and updates the user profile.

As described above, the receiving apparatus 100
of this embodiment may generate more precise user
5 profile because of generating the user profile based
on the manipulating history when not only receiving
the digital television broadcasting but also
accessing Internet or other media.

And, the procedures shown in Figs. 2A, 2B, 4A
10 and 4B are executed similarly in this embodiment.

In addition, though it is described about the
case that the present invention is applied to the
television broadcasting receiving apparatus in the
above embodiment, it is not limited to that case, but
15 the present invention may be easily applied to the
case of controlling the information search, selection
and operation using the user profile such as a
personal computer or various PDAs.

Furthermore, though the decoding process of
20 image or voice data, the searching process using the
user profile, the updating process of the user
profile, and so on are executed in hardware, but it
is also possible that such processes shown in Figs.
2A, 2B, 4A and 4B are executed in software using a
25 microcomputer.

And, in this case, program codes themselves of
the software realize the functions of the above-

described embodiment, and the program codes themselves and means for supplying these program codes to a computer, i.e., a storing medium storing such program codes, are constituted in the present

5   invention. As the storing medium storing these program codes, for example, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, a CD-ROM, a magnetic tape, a non-volatile memory card, a ROM and so on may be used.

10   In addition, the functions described in the above embodiment are executed by executing the program codes supplied from the computer, and even when the functions shown in the above embodiment are executed by OS (an operating system) with which these

15   program codes are operated in the computer and other application software in common, these program codes are included in the embodiment of the present invention.

         Furthermore, the present invention also

20   includes the case that the supplied program codes are stored in a memory provided to a function expansion unit connected to a computer or a function expansion board of the computer, a CPU provided in the function expansion board or the function expansion unit then

25   performs a part or all of the real process, and the functions of the above embodiment are executed by such process.

As described above, by using the present
invention, it becomes possible to comfortably search
or select information even when a desired user
profile does not exist in the apparatus.

5   Many widely different embodiments of the
present invention may be constructed without
departing from the spirit and scope of the present
invention. It should be understood that the present
invention is not limited to the specific embodiments
10   described in the specification, except as defined in
the appended claims.